



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/589,199

06/29/2007

Jochen Sang

102063.56904US

6506

23911 7590 02/28/2011
CROWELL & MORING LLP
INTELLECTUAL PROPERTY GROUP
P.O. BOX 14300
WASHINGTON, DC 20044-4300

EXAMINER

SAHA, BIJAY S

ART UNIT

PAPER NUMBER

1734

MAIL DATE

DELIVERY MODE

02/28/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/589,199	Applicant(s) SANG ET AL.	
	Examiner BIJAY S. SAHA	Art Unit 1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Request for Continued Examination

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/19/2010 has been entered.

Status of Claims

Claims 1-21 are pending. Claims 1-12 and 21 are under examination. Claim 13-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group of claims, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on 11/19/2009.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1734

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Horii et al EP 0456931 (Horii).

Regarding claims 1 and 2, Horii discloses Coanda spiral flow device (Title), a suction intake (Fig 2 part #1), an outlet (Fig 2 part # 4), a fluid channel extending between the suction intake and the outlet (Fig 2), a drive flow inlet (Fig 2 part # 11), in fluid flow communication with the fluid channel (Fig 2), discharge slit (Fig 2 part #5). surrounded by larger bore (compared to outlet #4) surface (part # 6 Fig 2). Horri further discloses adjustments of the threads via the coupling flanges (part # 3 and #9 Fig 2) the clearance of slit (part #5) is adjusted (col 3 lines 25-30).

Because the clearance of the slit can be set to a specified gap by the adjustment of the threaded fastenings, the flow cross section of the discharge slit is adjustable to maintain the pressure requirement. Because of the threaded fastenings, it would be obvious that the gap of slit (part #5) can be closed by tightening the flanges (#3 and #9); thus, a slit that can be completely closed.

Regarding the claim recitation “adjusts the flow cross section”, Horii discloses difficulty in the conventional design to adjust the slit to an accuracy of 0.01 mm in the assembly operation (page 2 left col, line46); however, the improved design of forming the sub assemblies A, B and C (Fig 2) allows such an accuracy and permits the

Art Unit: 1734

occasional assembly of units at the job site (page 3 left col, line 37). Consistent with the Horii teaching, slits are adjustable slits; hence, capable of adjustment of flow cross section and maintain the pressure requirements.

Regarding the claim recitation of “an electronic control unit”, it is noted that the said recitation controls the flow cross section electronically. It is further noted that the slits as disclosed by Horii controls the flow cross section in a manner analogous to the claimed recitation. Horii does not explicitly describe whether the slit are operated electronically or not. Assuming the slits are not operated electronically and operated manually, i.e. not operated by an electronic control unit, the manual operation is equivalent to electronic control in functionality. It is to be further noted: In MPEP 2144.04 III: Providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art.

Regarding the claim recitation intake pressure does not exceed a critical pressure, it is noted that functionality of the slit whether operated manually or electronically is to maintain the required pressure. In MPEP: 2114[R-1] Apparatus Functional Language: APPARATUS CLAIMS MUST BE STRUCTUR-ALLY DISTINGUISHABLE FROM THE PRIOR ART. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horii in view of Konishi US 6,524,076 (Konishi).

Regarding claims 1 and 2, Horii discloses Coanda spiral flow device (Title), a suction intake (Fig 2 part #1), an outlet (Fig 2 part # 4), a fluid channel extending between the suction intake and the outlet (Fig 2), a drive flow inlet (Fig 2 part # 11), in fluid flow communication with the fluid channel (Fig 2), discharge slit (Fig 2 part #5), surrounded by larger bore (compared to outlet #4) surface (part # 6 Fig 2); by adjusting the threads via the coupling flanges (part # 3 and #9 Fig 2) the clearance of slit (part #5) is adjusted (col 3 lines 25-30).

Because the clearance of the slit can be set to a specified gap by the adjustment of the threaded fastenings, the flow cross section of the discharge slit is adjustable to maintain the pressure requirement. Because of the threaded fastenings, it would be obvious that the gap of slit (part #5) can be closed by tightening the flanges (#3 and #9), thus a slit that can be completely closed.

Regarding the claim recitation “adjusts the flow cross section”, Horii discloses difficulty in the conventional design to adjust the slit to an accuracy of 0.01 mm in the assembly operation (page 2 left col, line46); however, the improved design of forming the sub assemblies A, B and C (Fig 2) allows such an accuracy and permits the occasional assembly of units at the job site (page 3 left col, line 37). Consistent with the

Art Unit: 1734

Horii teaching, slits are adjustable slits; hence, capable of adjustment of flow cross section.

Horii teaches the slip operation to maintain the required pressure. Horii does not explicitly teach the operation via electronic control unit that adjusts the flow.

Konishi teaches the electronic control unit that controls the flow rate of the fluid (claim 4). Konishi further teaches that the fluid flow can be controlled by an electronic control unit that takes input from sensors and operation of electronic control unit and pressure control is performed by the sensor input to control or maintain a required flow (Claims 4, 5, 6, 7 and Fig 1). Konishi further teaches that by maintaining the sufficient flow rate by electronic control saves energy and produces high reliability (col 2 line 55).

Thus, at the time of invention it would have been obvious to a person of ordinary skill in the art to control the slit operation for adjusting flow (Horii) by using an electronic control unit (Konishi). One of ordinary skill in the art, at the time of the invention would have been motivated to do so because the process of electronic control makes the system energy efficient and produces higher reliability.

Regarding the claim recitation intake pressure does not exceed a critical pressure, it is noted that functionality of the slit whether operated manually or electronically is to maintain the required pressure. In MPEP: 2114[R-1] Apparatus

Art Unit: 1734

Functional Language: APPARATUS CLAIMS MUST BE STRUCTUR-ALLY DISTINGUISHABLE FROM THE PRIOR ART. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function.

Claims 2 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP'93 in view of Konishi and further in view of McNair et al US 2856234 (McNair).

Regarding claim 2, teachings of Horii in view of Konishi have been delineated in the 103(a) rejection of claims 1 above.

Although Horii in view of Konishi discloses the discharge slit, and makes it adjustable by the threaded coupling flanges, Horii in view of Konishi does not explicitly teach the complete closure of the slit.

McNair discloses liquid proportioning device (Title, examiner considers liquid to be a 'fluid'), a drive-flow discharge slit (Fig 3 part # 28'), a fluid conduit (Fig 3 part # 22), variably adjustable (Fig 3 part # 28, #26), can be completely closed (Fig 3 part # 28, #26). McNair further teaches the complete opening or closing for the automatically effecting the controlled proportioning function and supply of chemical substances to a

Art Unit: 1734

flowing stream of liquid vehicle (col 3 line 2).

Thus, at the time of invention it would have been obvious to a person of ordinary skill in the art to control the slit operation for adjusting flow by an electronic control unit (Horii, Konishi) using complete closing of the slits (McNair). One of ordinary skill in the art, at the time of the invention would have been motivated to do so because the process of complete closing or opening facilitates the dispensing of fluids with controlled mechanical admixtures.

Regarding claim 21, McNair discloses variably adjustable (Fig 3 part # 28, #26), can be completely closed (Fig 3 part # 28, #26). Regarding the claim recitation “during operation of the Coanda flow amplifier”, Horii discloses difficulty in the conventional design to adjust the slit to an accuracy of 0.01 mm in the assembly operation (page 2 left col, line 46); however, the improved design of forming the sub assemblies A, B and C (Fig 2) allows such an accuracy and permits the occasional assembly of units at the job site (page 3 left col, line 37). Consistent with the Horii teaching, slits are adjustable slits; hence, capable of adjustment during the operation.

Claims 3, 4, 5, 10, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horii in view of Konishi and further in view of Simon US 6739574 (Simon).

Regarding claims 3, 4, teachings of Horii in view of Konishi have been delineated above in the 103 (a) rejection of claim 1 above.

Although Horii in view of Konishi disclose the suction and outlet of the Coanda device and the structure of the device, Horii in view of Konishi does not explicitly disclose the flow guiding element.

Simon discloses a piezo electric valve (Title) for fluid valves (col 1 line 4), control fluid flow through an orifice (col 1 line 15, Figs 4 'on' and 'off'; it is noted that the flow guiding element due to state of 'on' and 'off'), along a longitudinal axis (Fig 1), in a direction opposite to the fluid flow direction in the fluid channel ("transverse" direction col 2 line 19). Simon further teaches the flow control through an orifice (Abstract) that is helpful in maintaining the flow cross section (Fig 4, 'on' and 'off' states).

Thus, at the time of invention it would have been obvious to a person of ordinary skill in the art to control the slit operation for adjusting flow by an electronic control unit (Horii, Konishi) using flow guiding elements (Simon). One of ordinary skill in the art, at the time of the invention would have been motivated to do so because the process of using flow guiding elements facilitates the flow across the channel that is controlled through the orifice.

Regarding the claim recitation of first housing section and the upstream face, examiner considers that the piezoelectric device is attachable, per the US'5734

Art Unit: 1734

disclosure, to any orifice where the fluid control is required. Horii discloses the suction and the discharge of the Coanda device. It would be obvious to a person of ordinary skill to attach the flow control piezoelectric device on the discharge of the Coanda device and form the additional housing the 3rd housing or even multiple housings.

Regarding claim 5, Simon discloses an enclosure that surrounds the flow guiding elements (Fig 1 and 2).

Regarding claim 10, Simon discloses an actuating element (Fig 3 part # 1a and 1b). Actuating means, as disclosed by Simon, affects the axial displacement.

Regarding claim 11, Simon discloses piezoelectric actuator (col 1 lines 5—55, Fig 4).

Regarding claim 12, Simon discloses the 'off' position in Fig 4 (it is noted that 'off' position is the inactive state) and further discloses the direction opposite to the fluid flow. Regarding the recitation "resiliently", it is noted that 'pre loading force' (Fig 3) makes the system resilient to maintain the actuation motion (Fig 4).

Claims 6, 7, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horii in view of Konishi and Simon and further in view of Davies US5433365 (Davies).

Regarding claim 6, teachings of over Horii in view of Konishi and Simon have been delineated above.

Although Horii in view of Konishi and Simon disclose the suction, exhaust and flow control housing, Horii in view of Konishi and Simon does not disclose the sealing means and the housing attached to the sealing means.

Davies discloses the fluid nozzle device (Title), sealing means (Fig 1A part # 118 'o' rings), distancing rings (Fig 1A, 1B and 1C part # 145, 149) and expansion space (Part # 13), sealing element is in the groove (part # 118), circumferential surface of the flow path (Fig 1A, 1B and 1C part # 145, 149). Davies further teaches sealing devices with nozzle have the advantage of dynamic flow guides (col 2 line 45) and maintain expansion space (Fig 1a).

Thus, at the time of invention it would have been obvious to a person of ordinary skill in the art to control the slit operation for adjusting flow by an electronic control unit using flow guiding elements (Horii, Konishi and Simon) and utilizing the sealing means in a groove on the circumference (Davies). One of ordinary skill in the art, at the time of the invention would have been motivated to do so because the process of using sealing helps to maintain sealed joints with the benefit of expansion space.

Regarding claims 7, 8 and 9, Horii discloses the suction and the discharge of the Coanda device and Simon teaches housing that encloses the actuators with the expansion space as disclosed by Davies. It would be obvious to a person of ordinary skill in the art at the time of invention to attach the flow control piezoelectric device on the discharge of the Coanda device and form the additional housing the 3rd housing or even multiple housings.

Response to Arguments

Applicants' arguments filed 11/19/2010 have been fully considered but they are not persuasive.

Applicants argue about Horii and further argue about an electronic control unit. Examiner points out that Horii teaches the adjustments of the slits to control the pressure. Examiner further points out that the key concept is the flow adjustment. Even if Horii does not explicitly state electronic control and assuming total manual control, the pressure can still be controlled in a manner analogous to electronic control. Examiner further points out that control by electronic means does not necessarily make the amplifier novel. Examiner points out: In MPEP 2144.04 III: Providing an automatic or mechanical means to replace a manual activity which accomplished the same result is not sufficient to distinguish over the prior art.

Applicants argue about the pressure ratio that enters the drive flow discharge slit does not exceed a critical pressure ratio. Examiner points out that the claimed recitation

Art Unit: 1734

is the functionality of the device. Examiner reminds the applicants that the claim is drawn to a Coanda flow amplifier that is an apparatus. In MPEP: 2114[R-1] Apparatus Functional Language: APPARATUS CLAIMS MUST BE STRUCTUR-ALLY DISTINGUISHABLE FROM THE PRIOR ART. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function.

Examiner has cited a new prior art Konishi US 6,524,076 that addresses the claim recitation of electronic control unit. In view of the prior art, arguments related to electronic control unit are now considered moot.

Conclusion

The claims 1-12 and 21 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BIJAY S. SAHA whose telephone number is (571) 270-5781. The examiner can normally be reached on Monday- Friday 8:00 a.m. EST - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emily Le can be reached on (571) 272-0903. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1734

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Emily M Le/
Supervisory Patent Examiner, Art Unit 1734

/BIJAY S SAHA/
Examiner, Art Unit 1734